



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/997,553	11/29/2001	Martin E. Lee	PA0371-US	5147

7590 03/09/2004

STEVEN G. ROEDER  
THE LAW OFFICE OF STEVEN G. ROEDER  
5560 Chelsea Avenue  
La Jolla, CA 92037

EXAMINER

KIM, PETER B

ART UNIT	PAPER NUMBER
----------	--------------

2851

DATE MAILED: 03/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/997,553

Applicant(s)

LEE ET AL.

Examiner

Peter B. Kim

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-145 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-145 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

Applicant's arguments filed on Jan. 20, 2004 have been fully considered.

#### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6, 12-19, 31-34, 66-73, 82-85, 106-109, 113-115, 120-122, 123-130, 137, 138, 140, 141 and 143-145 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horikawa et al. (5,991,005) in view of Horikawa (6,124,923).

Horikawa et al. discloses in Fig. 8, a method of making a stage assembly and a stage assembly that holds a device (W) the stage assembly comprising a stage base (210), a device table being movable relative to the stage base along a first axis, a carrier (230), a device holder (240) that retains the device, a holder connector assembly (60, 52) that connects the holder bottom to the carrier top so that deformation of the carrier does not result in deformation of the device holder (col. 12, lines 42-64). The connector assembly includes three space apart flexures (60) wherein the connector kinematically connects the device holder to the carrier. The connector assembly includes three protrusions and three receivers (see Fig. 8). Horikawa et al. also discloses a device table (220) wherein the carrier is coupled to the table and the stage mover moves the table (col. 11, lines 39-67) and the device holder is rotatable relative to the device table (col. 12, lines 50-55). Horikawa et al. discloses an exposure apparatus including the stage assembly, a device manufactures with the exposure apparatus and a wafer on which an image has

Art Unit: 2851

been formed by the exposure apparatus (Fig. 1 and col. 1, lines 5-25). Horikawa et al. also discloses a method for making an exposure apparatus that form an image on an object comprising steps of providing an irradiation apparatus and the stage assembly discussed above (Fig. 1). Regarding Claim 123, Horikawa discloses a stage assembly that holds a device (W), the stage assembly comprising a device table (230), a device holder (240), the device holder coupled to the device table (Fig. 8) and a holder damper assembly (60, 52) for damping vibration between the device holder and the device table (col. 12, lines 42-62).

However, Horikawa et al. does not disclose the device table moving along a second axis orthogonal to the first axis and the carrier that is rotatable at least five degrees. Horikawa (6,124,923) discloses a stage unit with a stage base (10), a device table (9) movable along the first and second axis, and a carrier (8) movable relative to the device table and rotatable at least five degrees (abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to provide the device table and the carrier of Horikawa to the invention of Horikawa et al. in order to provide an accurate and efficient alignment as taught by Horikawa in col. 1, line 53 – col. 2, line 6.

Claims 86-88, 92-96, and 103-105 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horikawa et al. in view of Horikawa and Lee.

Horikawa et al. discloses in Fig. 8, a method of making a stage assembly and a stage assembly that holds a device (W) the stage assembly comprising a stage base (210), a device table being movable relative to the stage base along a first axis, a carrier (230), a device holder (240) that retains the device, a holder connector assembly (60, 52) that connects the holder

Art Unit: 2851

bottom to the carrier top so that deformation of the carrier does not result in deformation of the device holder (col. 12, lines 42-64). The connector assembly includes three space apart flexures (60) wherein the connector kinematically connects the device holder to the carrier. The connector assembly includes three protrusions and three receivers (see Fig. 8). Horikawa et al. also discloses a device table (220) wherein the carrier is coupled to the table and the stage mover moves the table (col. 11, lines 39-67) and the device holder is rotatable relative to the device table (col. 12, lines 50-55). Horikawa et al. discloses an exposure apparatus including the stage assembly, a device manufactures with the exposure apparatus and a wafer on which an image has been formed by the exposure apparatus (Fig. 1 and col. 1, lines 5-25). Horikawa et al. also discloses a method for making an exposure apparatus that forma an image on an object comprising steps of providing an irradiation apparatus and the stage assembly discussed above (Fig. 1). Regarding Claim 123, Horikawa discloses a stage assembly that holds a device (W), the stage assembly comprising a device table (230), a device holder (240), the device holder coupled to the device table (Fig. 8) and a holder damper assembly (60, 52) for damping vibration between the device holder and the device table (col. 12, lines 42-62).

However, Horikawa et al. does not disclose the device table moving along a second axis orthogonal to the first axis and the carrier that is rotatable at least five degrees. Horikawa et al. also does not disclose fluid bearings. Horikawa (6,124,923) discloses a stage unit with a stage base (10), a device table (9) movable along the first and second axis, and a carrier (8) movable relative to the device table and rotatable at least five degrees (abstract). Lee discloses a holder connector assembly (36) made of three fluid assemblies that connects the holder bottom to the carrier top so that deformation of the carrier does not result in deformation of the device holder

Art Unit: 2851

(para 0024, 0011). Lee discloses an exposure apparatus including the stage assembly, a device manufactures with the exposure apparatus and a wafer on which an image has been formed by the exposure apparatus (Para 0002-0006). Lee also discloses a method for making an exposure apparatus that forma an image on an object comprising steps of providing an irradiation apparatus and the stage assembly discussed above (para 0002-0006). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to provide the device table and the carrier of Horikawa and the fluid bearing of Lee to the invention of Horikawa et al. in order to provide an accurate and efficient alignment as taught by Horikawa in col. 1, line 53 – col. 2, line 6 and to reduce deformation of holder as taught by Lee in para 0005, 0006, and 0011.

Claims 7, 8, and 110 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horikawa et al. in view of Horikawa as applied to claims 1, 66, 106, and 123 above, and further in view of Lee.

The further difference between the modified Horikawa et al. and the claimed invention are the holder connector assembly including a fluid bearing assembly. Lee discloses in Fig. 2 and 3, a method of making a sage assembly and a stage assembly that holds a device (24) the stage assembly comprising a carrier (32), a device holder (10) that retains the device, a holder connector assembly (36) made of three fluid assemblies that connects the holder bottom to the carrier top so that deformation of the carrier does not result in deformation of the device holder (para 0024, 0011). Lee discloses an exposure apparatus including the stage assembly, a device manufactures with the exposure apparatus and a wafer on which an image has been formed by the exposure apparatus (Para 0002-0006). Lee also discloses a method for making an exposure

Art Unit: 2851

apparatus that form an image on an object comprising steps of providing an irradiation apparatus and the stage assembly discussed above (para 0002-0006). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Horikawa et al. with the fluid bearing of Lee in order to reduce deformation of the holder as taught by Lee in para 0005, 0006 and 0011.

Claims 9-11, 89-91, 111, and 112 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horikawa et al. in view of Horikawa and Lee as applied to claims 1, 86, and 106 above, and further in view of Usui.

The further difference between the modified Horikawa et al. and the claimed invention is fluid bearing in a triangular shaped cross-section and a pair of bearing pads. Usui discloses in Figure 1, bearing pads and fluid bearing in a triangular shaped cross-section. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Horikawa et al. by providing the fluid bearing of Usui in order to provide accurate perpendicularity and unitary structure as taught by Usui in paragraphs 0007-0011.

Claims 35-39, 45-51, and 59-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horikawa et al. in view of Horikawa and Korenaga.

Horikawa et al. discloses in Fig. 8, a method of making a stage assembly and a stage assembly that holds a device (W) the stage assembly comprising a stage base (210), a device table being movable relative to the stage base along a first axis, a carrier (230), a device holder (240) that retains the device, a holder connector assembly (60, 52) that connects the holder

Art Unit: 2851

bottom to the carrier top so that deformation of the carrier does not result in deformation of the device holder (col. 12, lines 42-64). The connector assembly includes three space apart flexures (60) wherein the connector kinematically connects the device holder to the carrier. The connector assembly includes three protrusions and three receivers (see Fig. 8). Horikawa et al. also discloses a device table (220) wherein the carrier is coupled to the table and the stage mover moves the table (col. 11, lines 39-67) and the device holder is rotatable relative to the device table (col. 12, lines 50-55). Horikawa et al. discloses an exposure apparatus including the stage assembly, a device manufactures with the exposure apparatus and a wafer on which an image has been formed by the exposure apparatus (Fig. 1 and col. 1, lines 5-25). Horikawa et al. also discloses a method for making an exposure apparatus that forma an image on an object comprising steps of providing an irradiation apparatus and the stage assembly discussed above (Fig. 1). Regarding Claim 123, Horikawa discloses a stage assembly that holds a device (W), the stage assembly comprising a device table (230), a device holder (240), the device holder coupled to the device table (Fig. 8) and a holder damper assembly (60, 52) for damping vibration between the device holder and the device table (col. 12, lines 42-62).

However, Horikawa et al. does not disclose the device table moving along a second axis orthogonal to the first axis and the carrier that is rotatable at least five degrees. Horikawa et al. also does not disclose a holder damper assembly. Horikawa (6,124,923) discloses a stage unit with a stage base (10), a device table (9) movable along the first and second axis, and a carrier (8) movable relative to the device table and rotatable at least five degrees (abstract). Korenaga discloses a holder damper assembly including magnet generating flux that dampen vibration (580, 581, col. 23, line 36- col. 26, lines 65) for damping vibration between the device holder



Art Unit: 2851

and the carrier (col. 12, lines 42-62). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to provide the device table and the carrier of Horikawa and the holder damper of Korenaga to the invention of Horikawa et al. in order to provide an accurate and efficient alignment as taught by Horikawa in col. 1, line 53 – col. 2, line 6 and to prevent vibration from reaching the device holder as taught by Korenaga in col. 12, lines 42-62.

Claims 20, 27-30, 74, 79-81, 116, 118, 119, 139, and 142 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horikawa et al. in view of Horikawa as applied to claims 1, 35, 66, 106, and 123 above, and further in view of Korenaga.

The further difference between the claimed invention and the modified Horikawa et al. is the holder damper assembly. Korenaga discloses a holder damper assembly including magnet generating flux that dampen vibration (580, 581, col. 23, line 36- col. 26, lines 65) for damping vibration between the device holder and the carrier (col. 12, lines 42-62). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Horikawa et al. with the holder damper of Korenaga in order to prevent vibration from reaching the device holder as taught by Korenaga in col. 12, lines 42-62.

Claims 21-26, 52-58, and 75-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horikawa et al. in view of Horikawa and Korenaga as applied to claims 1, 35, and 66 above, and further in view of Chen.

The further difference between the claimed invention and the modified Horikawa et al. is the layers of damper. Chen discloses in col. 23, line 62-col. 24, line 7, a layer of damper of

Art Unit: 2851

viscoelastic material to prevent vibration. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to provide the damper of Chen to the invention of Horikawa et al. in order to improve damping of vibration in mechanical equipment of Horikawa et al. as taught by Chen in col. 23 – col. 24.

Claims 117, and 131-136 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horikawa et al. in view of Horikawa as applied to claims 106, and 123 above, and further in view of Chen.

The further difference between the claimed invention and the modified Horikawa et al. is the layers of damper. Chen discloses in col. 23, line 62-col. 24, line 7, a layer of damper of viscoelastic material to prevent vibration. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to provide the damper of Chen to the invention of Horikawa et al. in order to improve damping of vibration in mechanical equipment of Horikawa et al. as taught by Chen in col. 23 – col. 24.

Claims 40 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horikawa et al. in view of Horikawa and Korenaga as applied to claim 35 above, and further in view of Lee.

The further difference between the modified Horikawa et al. and the claimed invention are the holder connector assembly including a fluid bearing assembly. Lee discloses in Fig. 2 and 3, a method of making a sage assembly and a stage assembly that holds a device (24) the stage assembly comprising a carrier (32), a device holder (10) that retains the device, a holder

Art Unit: 2851

connector assembly (36) made of three fluid assemblies that connects the holder bottom to the carrier top so that deformation of the carrier does not result in deformation of the device holder (para 0024, 0011). Lee discloses an exposure apparatus including the stage assembly, a device manufactures with the exposure apparatus and a wafer on which an image has been formed by the exposure apparatus (Para 0002-0006). Lee also discloses a method for making an exposure apparatus that forma an image on an object comprising steps of providing an irradiation apparatus and the stage assembly discussed above (para 0002-0006). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Horikawa et al. with the fluid bearing of Lee in order to reduce deformation of the holder as taught by Lee in para 0005, 0006 and 0011.

Claims 42-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horikawa et al. in view of Horikawa, Korenaga and Lee as applied to claim 41 above, and further in view of Usui.

The further difference between the modified Horikawa et al. and the claimed invention is fluid bearing in a triangular shaped cross-section and a pair of bearing pads. Usui discloses in Figure 1, bearing pads and fluid bearing in a triangular shaped cross-section. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Horikawa et al. by providing the fluid bearing of Usui in order to provide accurate perpendicularity and unitary structure as taught by Usui in paragraphs 0007-0011.

Art Unit: 2851

Claim 97 is rejected under 35 U.S.C. 103(a) as being unpatentable over Horikawa et al. in view of Horikawa and Lee as applied to claim 86 above, and further in view of Korenaga.

The further difference between the claimed invention and the modified Horikawa et al. is the holder damper assembly. Korenaga discloses a holder damper assembly including magnet generating flux that dampen vibration (580, 581, col. 23, line 36- col. 26, lines 65) for damping vibration between the device holder and the carrier (col. 12, lines 42-62). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Horikawa et al. with the holder damper of Korenaga in order to prevent vibration from reaching the device holder as taught by Korenaga in col. 12, lines 42-62.

Claims 98-102 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horikawa et al. in view of Horikawa, Lee and Korenaga as applied to claim 97 above, and further in view of Chen.

The further difference between the claimed invention and the modified Horikawa et al. is the layers of damper. Chen discloses in col. 23, line 62-col. 24, line 7, a layer of damper of viscoelastic material to prevent vibration. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to provide the damper of Chen to the invention of Horikawa et al. in order to improve damping of vibration in mechanical equipment of Horikawa et al. as taught by Chen in col. 23 – col. 24.

***Response to Arguments***

In response to applicant's arguments and amendment, Horikawa references is used in combination with Horikawa et al. reference to reject the claims.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Kim whose telephone number is (571) 272-2120. The examiner can normally be reached on Monday-Thursday from 8:30 AM to 6:00 PM. The examiner can also be reached on alternate Fridays during the same hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on 571-272-2112. The fax phone numbers for the organization where this application or proceeding is assigned is 703 872-9306.

Art Unit: 2851

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571 -272-2800.

A handwritten signature in black ink, appearing to read 'Peter B. Kim', with a stylized, flowing script.

Peter B. Kim  
Patent Examiner  
February 27, 2004